

SWBAT: discover Ohm's Law

Jan 4-7:20 AM

Welcome!!!

H. Leslie Grebe

* Pick up:

- slip of paper (for later)
- yellow concept sheet from the shelf
- white board, marker, eraser

Opening Question:


What happens to current (speed) as the brakes (resistance) gets bigger?


DECREASE, LESS CURRENT

Centering

Sep 7-7:04 AM

Concept sheet: 6 rows total

Concept	Meaning	Symbol	Units	Analogy
CHARGE	PROPERTY OF PROTONS & ELECTRONS THAT CAUSES ATTRACTION & REPULSION	q	COULOMBS C	
VOLTAGE =ELECTRIC POTENTIAL	POTENTIAL BASED ON POSITION IN AN ELECTRIC FIELD "PUSH"	V	VOLTS V $V = \frac{J}{C}$	-PERSON -PEDALING \Rightarrow THE PUSH
CURRENT	THE FLOW OF ELECTRIC CHARGE $= \frac{\text{CHARGE}}{\text{TIME}}$	I $I = \frac{q}{t}$	AMPERE A $1A = \frac{1C}{1s}$	-WHEEL -CHAINS MOVING
RESISTANCE	OPPOSITION OF CURRENT "AGAINST THE FLOW"	R	OHMS Ω	BRAKES



Feb 23-7:34 AM

Current, Voltage, and Resistance: The Bicycle Analogy

If I were to pedal a bike while gently squeezing the hand brakes, what in that situation would be like
current?
voltage?
resistance?

I : WHEELS, CHAIN, MOVING
 V : PUSH
 R : BRAKES



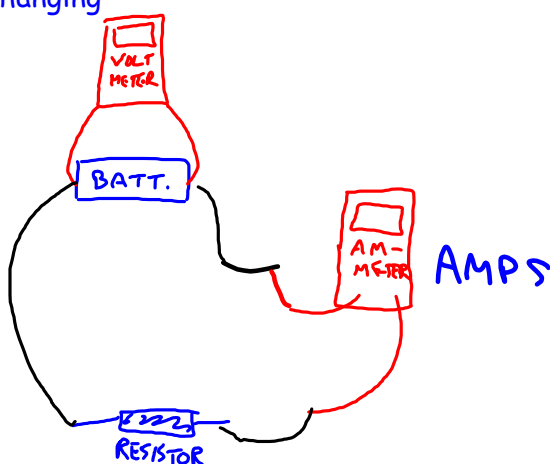
BASE LEVEL	BASE LEVEL	BASE SPEED
Pedaling Effort	Braking	Speed of bike?
Same	More	Slow
Same	Less	FAST
More	Same	FAST
Less	Same	SLOW

Feb 23-7:43 AM

Gathering our experiment data!

- * Each group: 1 or 2 students do simulation lab
 - follow directions on the sheet
- * Each group: 2-3 students use the equipment
 - use the diagram below
 - choose a team name
 - let me know what you are changing

SAFETY
RULE:
IF BATTERY
GETS HOT,
STOP IT



Mar 8-7:43 AM

TEAM	TRIAL 1 or 2	V(V)	R(Ω)	I(A)	
SIX	1	1.45	10	0.12	1.2
	2	1.49	50	0.03	1.5
LAKERS	1	2.81	50 Ω	0.05	2.5
	2	6.2	50	0.11	5.5

Dec 13-8:21 AM

Concept sheet: 6 rows total

Concept	Meaning	Symbol	Units	Analogy
CHARGE	PROPERTY OF PROTONS & ELECTRONS THAT CAUSES ATTRACTION & REPULSION	q	COULOMBS C	
VOLTAGE = ELECTRIC POTENTIAL	POTENTIAL BASED ON POSITION IN AN ELECTRIC FIELD "PUSH"	V	VOLTS V $V = \frac{J}{C}$	PERSON PEDALING ⇒ THE PUSH
CURRENT	THE FLOW OF ELECTRIC CHARGE $= \frac{\text{CHARGE}}{\text{TIME}}$	I $I = \frac{q}{t}$	AMPERE A $1A = \frac{1C}{s}$	- WHEEL CHAINS MOVING
RESISTANCE	OPPOSITION OF CURRENT "AGAINST THE FLOW"	R	OHMS Ω	BRAKES
OHM'S LAW	VOLTAGE = CURRENT X RESISTANCE	$V = I \cdot R$	$V = I \cdot \Omega$	HOW HARD YOU PEDAL & BRAKE AFFECTS SPEED

$$\frac{q}{I \cdot t}$$

$$\frac{V}{I \cdot R}$$

Feb 23-7:34 AM

Practice Ohm's Law!

$$\text{VOLTAGE} = \text{CURRENT} \times \text{RESISTANCE}$$

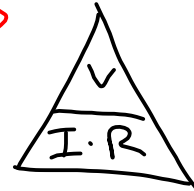
$$V = I \cdot R$$

a) Resistance $R = 10 \, \Omega$ Current $I = 3A$
What's voltage?

$$V = I \cdot R = 3A \cdot 10 \, \Omega = 30V$$

b) $V = 12V$, $I = 4A$, $R = ?$

$$R = \frac{V}{I} = \frac{12V}{4A} = 3 \, \Omega$$



c) $V = 3V$ $R = 6 \, \Omega$ $I = ?$

$$I = \frac{V}{R} = \frac{3V}{6 \, \Omega} = 0.5A$$

Mar 9-7:31 AM

Outrageous Acts of Science

A show about viral videos and the science that makes them possible...

"Arc Attack" Power Junkies #1

1. Just watch
2. Read the questions
3. Watch again
4. Discuss
5. Watch a last time to catch anything you might have missed



Oct 4-7:27 AM

Daily 3 Questions

- * Every day except test/project days
- * 3 Questions on the topics of the day
- * Main source of daily points
- * I am happy to give credit when I have no concerns about someone giving or getting help with the answers.

You can't get your points if you don't have your **NAME!!!**

Name	Period
1.	
2.	
3.	

Sep 9-7:32 AM

1. What is the formula for Ohm's Law (in words or symbols) relating voltage, current, and resistance?

$$V = I \cdot R \quad \text{VOLTAGE} = \text{CURRENT} \times \text{RESISTANCE}$$

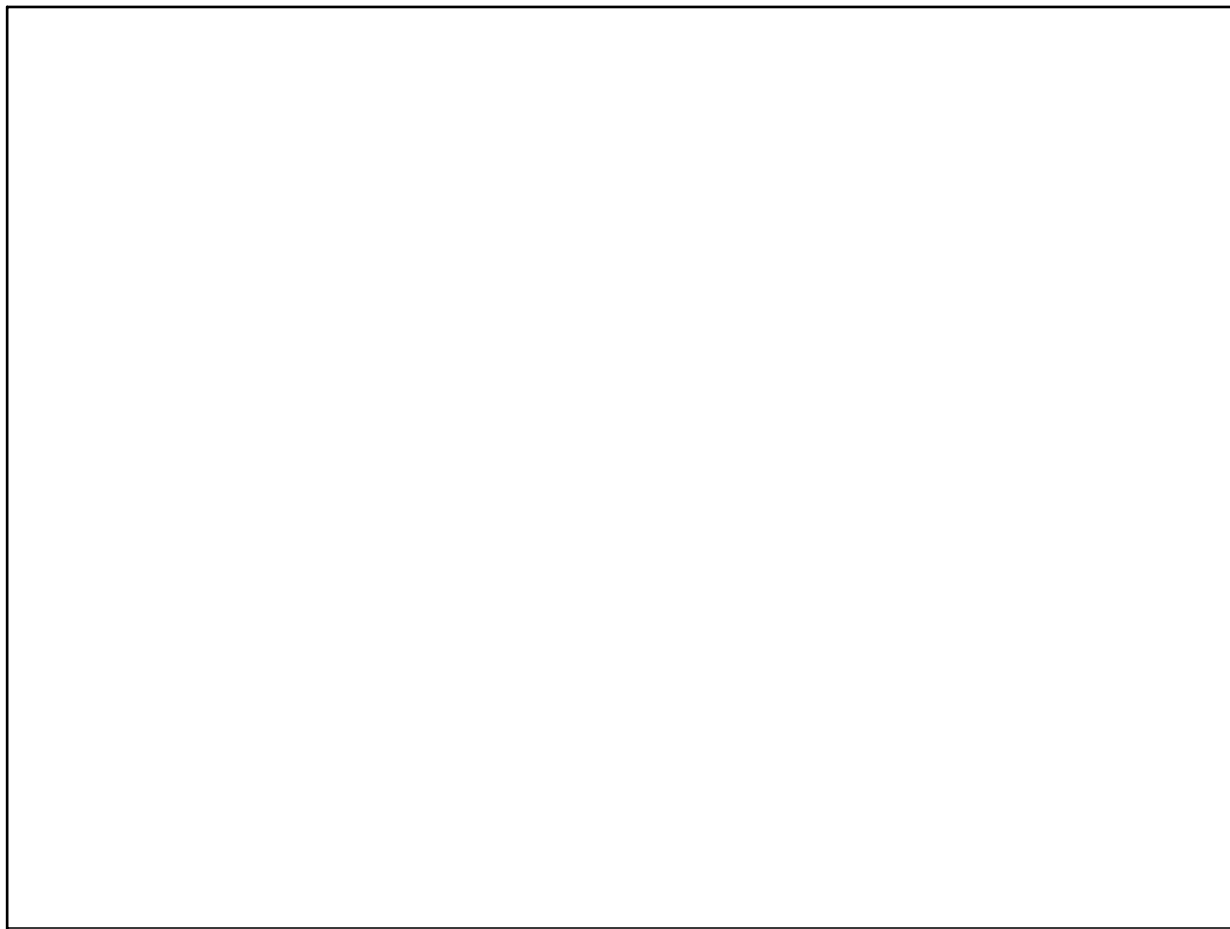
2. When a headlight is 3 ohms and is connected to a 12-V battery, how many amps of current flow?

$$I = \frac{V}{R} = \frac{12V}{3\Omega} = 4A$$

3. $R = 10 \text{ ohms}$, $I = 3A$, $V = ?$

$$V = R \cdot I = 10\Omega \cdot 3A = \underline{30V}$$

Feb 18-6:59 AM



Feb 27-10:28 AM